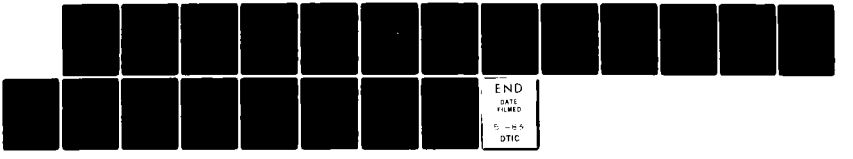
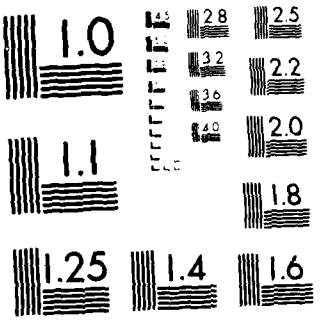
AD-A126 751 APPLICATION OF GEODEMOGRAPHICS TO THE ARMY RECRUITING PROBLEM(U) CLARITAS CORP ARLINGTON VA J A DEREU ET AL. OCT 81 MDA903-80-C-0561 1/1

UNCLASSIFIED F/G 5/1 NL





(1)

ABSTRACT

MDA903-80-C-0561

TITLE: APPLICATION OF GEODEMOGRAPHICS TO THE ARMY RECRUITING PROBLEM

AUTHORS: LTC John A. DeReu
Mr. Jonathan E. Robbin (both will present)

ORGANIZATIONS:

U.S. Army Recruiting Command
ATTN: USARC PAE-RS
Fort Sheridan, IL 60037
AUTOVON 459-2393/2190

CLARITAS CORPORATION
1911 North Ft Myer Drive
Rosslyn, VA 22209
Commercial (703) 841-9200

Oct 1981

ABSTRACT: Numerous methods of allocating recruiters, assigning mission and directing the advertising effort have been used during the past decade. Criteria such as the number of military available (ages 17-21), the number of qualified military available (ages 17-21), the number of male high school seniors, past production and/or the results of other services' efforts have all been used in an attempt to solve the recruiting equation. Early in 1980 USAREC developed a time-phased stepwise regression model for mission assignment, but that was only a partial solution to a single part of the problem. During the past year, two major new thrusts were begun which apply geodemographic analysis down to ZIP Code level to pinpoint the recruiting market and to optimize recruiting resource allocation. The first of these, the Army effort, centers on high school seniors and graduates discounted by quality and quantity factors to identify the available market for each recruiter. The civilian effort by Claritas Corporation, under Army contract, applies proven neighborhood clustering techniques, based on demographic variables at the ZIP Code level, to identify specific locales of unrealized potential. These micro-defined areas of untapped potential are identified for each category, age group, sex and MOS of recruits. The results of merging the military and civilian efforts represent a significant breakthrough in identifying, quantifying and targeting all facets of recruiting through an integrated system. This approach may be applied outside recruiting where there is a need for establishing sales or market potential estimates, field force allocations, and the targeting of advertising.

SPECIAL SESSION PREFERENCE: Manpower, Training and Personnel Management.

ESTIMATED TIME REQUIRED: 30 minutes.

CLASSIFICATION AND RELEASABILITY OF PAPER: Unclassified, Distribution Unlimited.

TITLE: APPLICATION OF GEODEMOGRAPHICS TO THE ARMY RECRUITING PROBLEM

AUTHORS: LTC John A. DeReu, US Army Recruiting Command
Mr. Jonathan E. Robbin, Claritas Corporation

"You have, in a week, identified and quantified what it has taken me my entire command tour to learn and subjectively apply."
- An outgoing DRC Commander

INTRODUCTION

The above statement resulted from the application of geodemographics at the ZIP Code level to a district recruiting command. The power and broad range of applications represent a breakthrough in the total spectrum of market analysis. The shotgun approach to marketing has been overcome. Specific, pinpointed market segmentation is possible for the quantification and location of potential, allocation of resources and targeting of advertising and sales promotion.

BACKGROUND

The United States Army Recruiting Command (USAREC) has elements located in all 50 states, the District of Columbia, Europe, Panama, the Phillipines, Guam, American Somoa, Saipan and Korea. Its organization is as depicted below:

ELEMENT		COMMANDER
HQ USAREC	1	MAJOR GENERAL
REGIONS	5	COLONEL
DISTRICTS (DRC)	57	LTC
AREAS (ARC)	256	CAPTAIN
STATIONS (RS)	2100	E7-E5
RECRUITERS	6000	

The allocation of resources, both personnel and fiscal; the assignment of mission; and the direction of advertising effort have challenged the command since its existence. In the past, various indicators were used to quantify the distribution of assets and mission.

- Military Available (MA) - The number of males, 17-21 years old.
- Qualified Military Available (QMA) - As above, but with a mental and physical disqualification factor applied.
- DOD Take - The total recruits enlisted by all services in a given area.
- Past Production - Self explanatory.

In the last several years, under pressure from within the Army, DOD and Congress, the Army has had to move into a different market, one constrained by limitations on the number of both non-high school graduates and lower mental categories. This led many of the command elements to use a new factor to determine their market--the number of high school seniors (HSSR).

All of the above factors have major deficiencies. With MA, QMA and HSSR, the quality significantly varied in different geographic areas and even within areas. Yet this was not recognized. "DOD take" was biased by the Army itself, which was expected to pull 35-45 percent of the total. Both the latter and "past production" did not recognize areas of untapped potential, the geographic propensity toward a particular service, nor the number of recruiters in a given area. Past production further penalized those elements which had previously done well by expecting more, while giving a handicap on expectations to those doing poorly. The change in the market was only superficially recognized.

The mission assignment process to DRC level gained sophistication in early 1980 when a time-phased stepwise regression model was developed incorporating the following variables:

SIZE (SQ MILES)	RECRUITER AIDES
PAST PRODUCTION, BY CATEGORY	BLACK MA
QMA	LOCAL ADVERTISING DOLLARS
HSSR	OTHER SERVICE RECRUITERS
RECRUITERS	OTHER SERVICE TAKE
RECRUITER EXPERIENCE	UNEMPLOYMENT
YATS PROPENSITY	INCOME

The regression model did much to explain variances in production and was used to assign mission, yet it still had major drawbacks--the heavy reliance on past production and the requirement to use data of questionable accuracy (unemployment). The greatest deficiencies, however, were the lack of specificity below DRC level and its use being limited to mission assignment only. Nothing had yet been developed to identify potential and to join resource allocation, mission assignment, advertising, and propensity.

RECRUITER ZONE ANALYSIS (RZA)

In the summer of 1980, USAREC launched a major market analysis effort involving on-site analysis of all 57 DRC by a single USAREC staff section--the Region Support Division of Program Analysis and Evaluation Directorate. The purposes of this effort, known as RZA, were multifold:

- To identify and quantify the prime recruiting market at the lowest specific level.
- To distribute recruiting resources equitably across the command.
- To insure that each recruiter had sufficient market to be successful.

The on-site phase of the RZA requires plotting of each high school, school district boundary and zip code and computing an individual recruiter's market (zone) using HSSR, past graduating class size, go-to-college rate, college stopout rate and a mental qualification indicator. The exact market geography was further defined by the political/economic boundaries and traffic patterns. Major redistributions and restructurings occurred and continue to occur as a result of the RZA effort. All RZA information is entered into a central data base providing a basis for continuing analysis. All 57 DRC will be completed by the end of the 1981 calendar year.

As successful as the RZA effort is, the methodology has shortcomings recognized from its initial inception. The demographics of each zone or neighborhood were still only superficially factored, primarily because the more specific data were not available. As an example, a definite relationship exists between household income and propensity to join any military service. One could assert that the income variable is subsumed under the "go-to-college" and "mental qualification" factors, although the relationship is valid only in the aggregate. Another refinement was still needed and an Army contract with Claritas Corporation, signed in August 1980, provided an answer not only for the RZA, but for mission assignment and advertising.

THE CLARITAS CORPORATION BACKGROUND

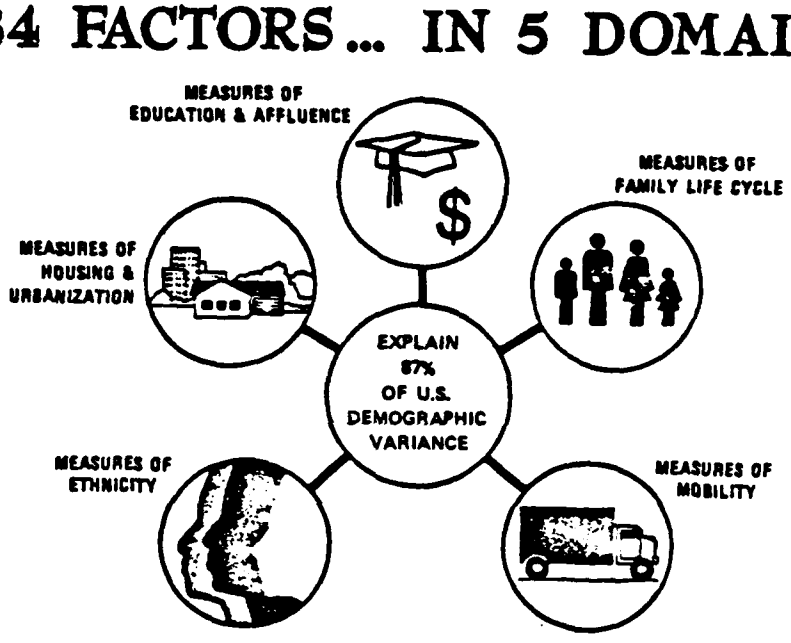
Claritas, founded in 1971, is a consulting, information product and systems development firm which specializes in the application of small area demographic (U.S. Census) data to marketing problems. Small areas include neighborhood-sized units such as the 37,000 five-digit ZIP codes or the 230,000 Census "Block-groups". These areas hold populations which are far more homogeneous in their socio-economic characteristics than larger and less distinctive areas such as regions, states and metropolitan county groups.

Claritas originated and published REZIDE, a compilation of Census data at the five digit ZIP level, to fill an information gap in government statistics and to render the data practical for commercial marketers. Any entity with customer lists, warranty records, circulation files, survey data or administrative records, can easily aggregate these records by ZIP at low expense. Given comprehensive Census data summarized to the same level of detail, it became possible, with the advent of REZIDE, to relate neighborhood or community characteristics to levels of sales, consumption of media or voting behavior, for example. Pilot studies performed by Claritas in the early seventies for large publishers, such as TIME, Inc.; banks, including Chase Manhattan; and government planners, such as the National Institute of Mental Health, showed that socio-economic neighborhood characteristics were indeed powerful predictors of the probable purchasing, media usage and cultural behaviors of the inhabitants of the U.S. communities. Even more compelling was the realization by businessmen that these predictions could be translated into precise action at local levels, mediating decisions on design of sales territories, location of retail outlets, segmentation of direct marketing efforts (mailing lists), or choice of compact markets for concentration of print and electronic media advertising. It was demonstrated in actual marketing actions involving millions of dollars of investment that substantial savings could be realized along with growth in sales by targeting the selling effort on small areas selected for their high sales potential as predicted by geodemographic analysis. Knowing the sales results by ZIP for a sample of areas or for a high performing segment of the market also permitted growth through targeting new areas of consistent demography thereby effectively exploitating potential.

In order to extend and simplify the practical application of geodemographic targeting, Claritas originated a number of powerful multivariate systems based on the small area Census data resources it had developed. Since these systems have been applied in support of USAREC's mission, they will be briefly described here.

1) Claritas' 34 Factor measurements of ZIP Demographic Variance

Using the base REZIDE file of Census-based counts of population and households by 968 of their characteristics for each ZIP, Claritas derived through transformation, data screening, editing and statistical manipulation a set of 535 normally distributed variables measuring the most important socio-economic aspects of each ZIP's aggregate population. The variables were chosen to represent the major determinants of human grouping as observed in several localized "social area" or "factorial ecology" studies, such as Shevky, Bell, et al. (see bibliography) The domains of content in the Claritas model expanded these studies to include broadly five major subject areas:



Each domain was represented by 60 to 150 variables. Using principle components factor analysis with iterated communality estimation and varimax rotation, this data set was reduced in partitions to a set of 34 orthogonal factors explaining 87% of the common variance of the items. Thirty-four factor measures or scores were then derived by the complete regression method (R^2 = 0.998 on the average) for each ZIP, expressed as normal deviates (standard scores with unit variance and zero mean). The pattern on these scores for each ZIP is a condensed or parsimonious way of expressing 87% of the differences of this ZIP from the other ZIP's on all 535 variables. These factor scores are linear, additive variables with zero collinearity which serve as extraordinarily powerful indicators of area differences and similarities. When used as independent variables in correlating neighborhood (ZIP) characteristics with sales data or other series exogenous to demography, such as rates of recruitment, the relationships are maximally effective in achieving highly significant predictions. If there is any demographic variance in a dependent item, these factor scores have a way of finding it.

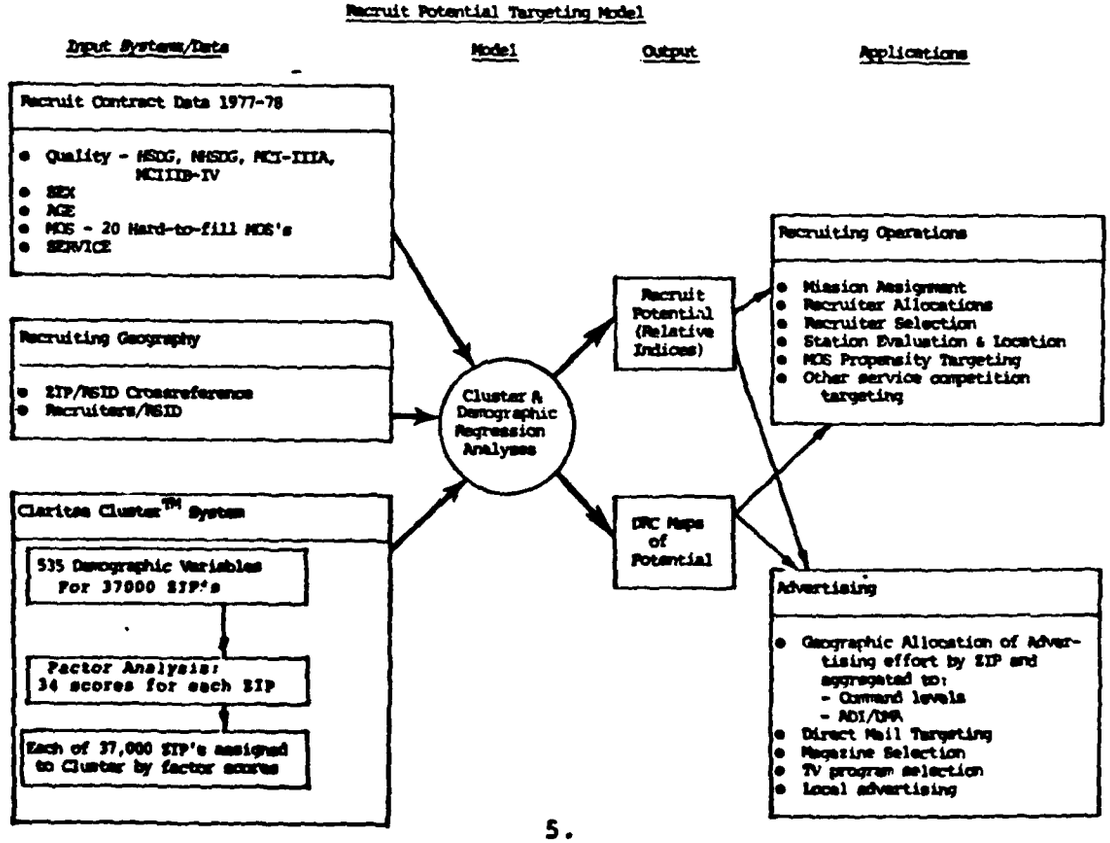
2) The Claritas 40 Cluster System of Neighborhood (ZIP) Typology

Using the thirty-four factor scores described above, Claritas proceeded to compare each ZIP to every other ZIP on the pattern of these exhaustive measures of demographic variance. Using K-means (MICKA) cluster analysis, each ZIP was assigned to one of forty distinct neighborhood types or Claritas Clusters™. These groups of extraordinarily homogeneous ZIP's describe the gamut of communities familiar to Americans. While certain Clusters or types occur more often in certain regions, generally each type can be found in all parts of the country. The Clusters appear to be highly stable over time. People moving out are replaced by others with similar characteristics.

By definition, the taxonomic technique of cluster analysis also creates classifications or groupings which are maximally distant or different from one another. Thus, if data outside the Census, such as consumer product sales, media circulations, health information, educational achievement scores, political attitudes, consumer surveys or leisure-time activities are aggregated by Claritas Clusters (these are all actual case histories), dramatic variances in level of incidence or "penetration" are usually observed. A chart showing these 40 Clusters and a convenient grouping into ten Cluster groups is shown on the following page.

THE ARMY CONTRACT

The primary purpose of Claritas' contract with USAREC is the development of geodemographically determined recruit potential indicators for each residential five-digit ZIP Code in the US to supplement and add exactitude to the Army's market analysis. The breadth of this effort with current and developing applications is depicted in the next chart.



ZIP-MARKET CLUSTERS (40) AND CLUSTER GROUPS (10)
Groups and Clusters Within Groups Ranked In Descending ZQ Order

Group Code	Descriptive Title	ZIP-MARKET CLUSTERS		U.S. HOUSEHOLDS		ZQ
		Cluster Number	Nicknames	1000's	%	Scores
S1	Educated, Affluent, Elite White Families In Owner-Occupied, Green-Belt Suburbs	28	Blue Blood Estates	515.2	.67	83
		5	Furs & Stations Wagons	1,800.5	2.33	75
		25	Two More Rungs	1,284.4	1.66	70
		7	Pools & Patios	3,055.1	3.95	67
				6,655.2	8.61	
S2	Educated, Affluent, Semi-Urban Sophisticates W/Singles & University Enclaves	8	Money & Brains	1,054.1	1.36	75
		20	Young Influentials	2,230.7	2.89	66
				3,284.8	4.25	
T1	Mobile, Upper-Middle, Child-Raising Families In New Suburbs & Ex-Urban Towns	24	Young Suburbia	4,841.8	6.27	64
		1	God's Country	1,771.4	2.28	58
		27	Levittown, U.S.A.	3,435.8	4.45	57
		17	Young Homesteaders	3,424.3	4.43	48
				13,473.3	17.43	
U1	Educated Singles In Hi-Rise Areas W/ University, Artistic & Downscale Elements	21	Urban Gold Coast	306.7	.39	67
		31	Sun-Belt Singles	2,817.9	3.65	55
		37	Bohemian Mix	654.6	.85	53
				3,779.2	4.89	
S3	Middle-Class, Native-White, Blue-Collar Families In Industrial Urban Fringes	30	Blue-Chip Blues	2,952.0	3.82	58
		16	Middle America	2,982.6	3.86	50
		40	Blue-Collar Nursery	1,106.4	1.43	47
				7,041.0	9.11	
U2	Mixed, Middle-Class, Foreign Stock & Minorities In Dense Urban Row-House Areas	23	Bunker's Neighbors	3,737.3	4.84	57
		3	Old Melting Pot	1,317.3	1.70	52
		36	Blue-Collar Catholics	1,990.6	2.57	51
		2	Eastern Europeans	105.0	.14	49
		4	Heavy Industry	759.3	.98	42
				7,909.5	10.23	
T2	Lo-Mid To Downscale Mill & Factory Towns W/Educated Gentry & Blue-Collar Labor	18	Old Brick Factories	2,458.7	3.18	46
		33	Down-Home Gentry	2,874.9	3.72	45
		22	Mines & Mills	1,724.4	2.23	41
		12	Big Fish/Small Pond	2,166.7	2.81	40
		13	Norma Rae-Ville	1,532.3	1.98	36
				10,757.0	13.92	
R1	Minor Cities & Rural Towns Amidst Farms & Ranches, Across Agricultural Mid-America	29	Coalburg & Corntown	2,816.6	3.64	45
		19	Shotguns & Pickups	1,709.1	2.21	41
		34	Agri-Business	1,753.3	2.27	40
		35	Grain Belt	1,470.0	1.91	32
				7,749.1	10.03	
U3	Mixed Black, Spanish & Foreign Stock In Aging, Center-City, Row & Hi-Rise Areas	9	Hispanic Mix	376.6	.49	43
		26	Ethnic Row Houses	1,663.6	2.15	43
		14	Emergent Minorities	1,623.2	2.10	42
		11	Dixie-Style Tenements	1,564.6	2.02	36
		32	Urban Renewal	1,796.8	2.33	35
				7,024.7	9.09	
R2	Mixed, Unskilled Whites, Blacks, Spanish & Indians In Poor Rural Towns & Farms	39	Marlboro Country	2,450.5	3.17	38
		10	Back-Country Folks	2,297.8	2.97	35
		38	Share Croppers	2,038.0	2.64	30
		15	Tobacco Roads	913.8	1.18	30
		6	Hard Scrabble	709.7	.92	28
				8,409.8	10.88	
		80		1,201.2	1.56	
TOTAL U.S.				77,284.6	100.00	

* ZIP QUALITY - A weighted composite of education and affluence variables, which permits Clusters to be ranked and grouped according to recognized socio-economic levels. (Avg. US = ZQ 50)

Recruit potential indices were developed separately for several educational and mental categories, as well as for a number of MOS. Target market profiles by Cluster will be applied to the evaluation of promotional and advertising efforts in selected DRC. Measures of recruit potential were aggregated from ZIP Codes to the various command levels, 200 television markets and 323 Standard Metropolitan Statistical Areas (SMSA). In addition, the contract calls for application of the indices in locating new recruiting stations and the evaluation of existing stations. This effort will be supported by computer-generated maps of recruit potentials for each DRC by station.

MODEL RESULTS

The model producing these indices used ZIP-level USAREC-provided contract data and command boundaries along with the 34 factor scores from the Claritas Cluster system. These 34 factor scores or their non-linear transformations (squares), together with a measure of recruiter strength and the proportions of ZIP populations enrolled in college and serving in the Armed Forces, were used as independent variables to develop a linear model where the dependent variable was the logarithm of the average annual recruit penetration from 1977 and 1978 into the available population of males in a specified age group (i.e., 17-21 years). The model was run on data bases developed separately for seven geographically specified regions. These seven US sub-areas for which equations were produced were configured by clustering DRC's with similar correlations of the independent variables with recruit penetration.

Within the sub-areas, very small ZIP's (less than 500 population) were aggregated with nearby small ZIP's of the same Cluster to reduce the statistical volatility of the dependent variable. This procedure produced a file of 7043 aggregate areas which represented the data base for all subsequent analyses.

In addition to the above, a research strategy was employed which has proven successful in the prediction of commercial sales potential, the "better half" technique. The universe of ZIP areas was stratified into two sub-sets within each Cluster, the above average recruit-penetrated areas and the below average. Recruit potential equations were computed within each sub-region for the top half only. The benefit of this technique lies in the fact that failure or underperformance is much harder to predict than success or overperformance. In other words, exogeneous factors such as local objectives or quotas based on non-uniform decision rules, actual command efficiency or management quality, unemployment, local traditions or poor siting, all may conspire to explain failure. The demographic predictors, however, cover the entire range in their variance, and are more efficient in the top half where there is less exogeneous "noise" in the dependent variable. These considerations were borne out in the model development in this project. The multiple R^2 was greater by 50% to 80% in the top half than the R^2 of the bottom half. Thus, the approach has a statistical validation.

The model was run for three categories of recruits:

A) All high-school diploma graduates, 17-21 years of age (HSDG)

B) All high mental category (I-IIIA)(HIMC)

C) All high mental category high school diploma graduates (HSHI)

Predicted recruit penetration is calculated by evaluating the regression equation. This is that portion of the recruit prediction explained by demography and on the average, explains 65% of the variation in recruiting penetration at the ZIP level. The sales deficit or untapped recruit potential is produced by subtracting the actual observed penetration from predicted for each ZIP. Where untapped potenial is negative, it is set to zero. (Expected recruit penetration is equal to predicted except in those cases.) Expected penetration is a relative measure of achievement possible if demographic potential is exploited and the ZIP is not subject to exceptional exogenous effects. Ratioing the ZIP value to the U.S. average produces the recruit potential index (RPI). When a base population, e.g., 17-21 year old males, or HSSR or MA, is multipied by expected potential a similiar relative indicator of performance is gained in terms of the number of annually expected new recruits, provided the given area performs as the better half. A scale can be applied relatively to accommodate changing objectives.

The Cluster profiles of recruits by age, education and mental category, as well as by proportions of recruits entering a variety of hard-to-fill MOS's, showed Chi Squares significant beyond the 99% level of confidence. It was found that neighborhood type is indeed highly related to recruit penetration for each category of recruit.

An initial comparison of the actual graduate and senior male (GSM) mission assigned for FY 81 and the Claritas model potentials showed a correlation (r) of +.93 for the five regions and +.82 for 56 DRC. (The 57th DRC, San Juan, was not included because demographics are not available in the data base). The purpose of this check was not to validate either the regression or Claritas models but solely as an indicator of comparability.

CURRENT APPLICATIONS

The ultimate objective is to efficiently increase productivity by applying the results towards the allocation of recruiting resources. These resources include personnel, facilities, advertising, incentives, training and command. Various strategies are being employed to distribute these resources according to the levels of total and untapped potentials identified by the study. The specific uses of the analysis listed below are actually ongoing and in some phase of implementation.

MISSION ASSIGNMENT AND RECRUITER ALLOCATION

From the Headquarters, USAREC level, mission assignment is made directly to the 57 DRC. The equity of the established mission is of utmost importance, for the careers of the personnel and the overall success of the command depend on the setting of difficult, but obtainable, objectives. The currently directed command objective for FY 82 is 87,500 HSDG(M) contracts, a significant increase over previous annual levels in this prime category, while simultaneously the constraints on the lower mental categories have been tightened.

The Claritas model identified potentials at the DRC level by aggregating ZIP Code estimates. These potentials, both total and untapped, matched against current production, pinpoint locations where, with an expenditure of some positive effort by USAREC, the greatest opportunities exist for meeting the increased requirements.

The potentials in some DRC are currently being exceeded, yet in all cases, untapped potential exists. Where some areas within a DRC exceed the better half average penetrations, others fell short creating untapped potentials despite overproduction in the DRC. The extreme case of Detroit might illuminate this concept. The Claritas model identified an expected HSDG potential of 1571 with an untapped potential of 734 based on 1977-78 data. Yet actual 1981 production in this category will exceed 2000. Obviously, exogenous factors affected the performance and these factors are identifiable and some clearly illustrate the sort of positive actions USAREC might take to realize potentials. In this case, the unemployment rate jumped from 7.3% in 1977 to 13.4% in 1981, with even greater rates among minority teenagers. Further, USAREC reassigned one of its best commanders and an experienced Sergeant-Major to Detroit, increased recruiter strength by 25% and added supplemental local advertising dollars to the district. The actual highest increases in production occurred where the Claritas model showed the highest untapped potential. 1977-80 production growth is related to predicted untapped potential with a correlation (r) equal to +.70 in Detroit. In the future, some presently exogenous factors may be included to enhance predictibility. In some cases, it may be possible to create a reactive model where the effect of the exogenous variable is assessed differently by Cluster.

Below DRC level, the real power of the indices surfaces, although the accuracy of the population projection became less exact. (The MA count at ZIP Code level is an estimate based on the 1970 Census, pending development of data from 1980.) Here the merging of the Claritas indices with the Army RZA effort, which identifies the actual number of high school seniors, overcomes the projected population problem. By using the propensity index times graduates and seniors available, the actual mission per recruiter can be calculated.

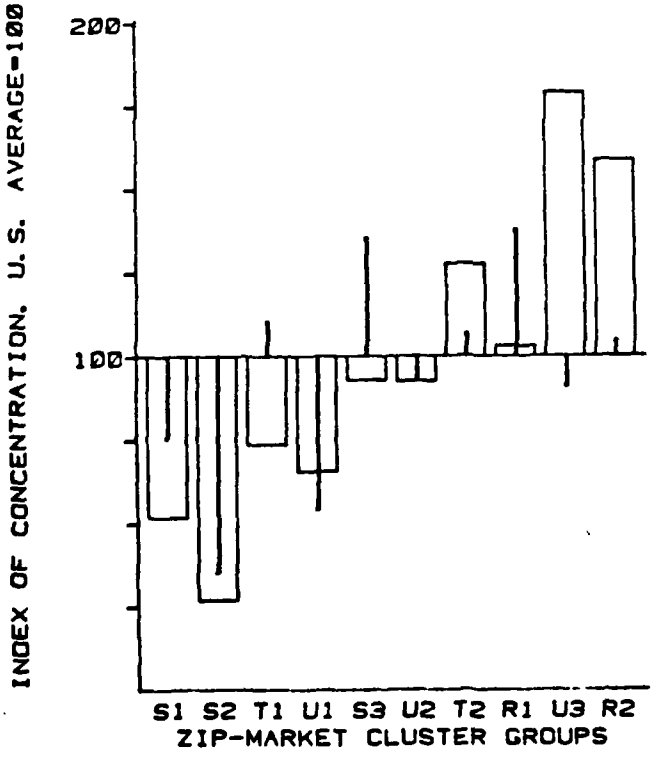
The use of the merged data for recruiter allocation is even more important. The number of recruiters authorized for command is constrained, making it imperative to optimally allocate these limited assets. By using the propensity and population to get expected results, recruiters, both faces and spaces, can be reshuffled to areas where the greatest marginal returns can be realized.

At the individual recruiter level, the use of propensity indices permits varying the size of the market assigned. As an example, the recruiting station indices within the Detroit DRC for high school graduate accessions ranged from 191 to 20. A scale was developed which inversely correlated potential index and market size, changing the latter by five percent for every ten percent change in propensity. Consequently, the market allocated per recruiter in the high propensity inner-city areas was substantially less than that in the more affluent suburbs. By insuring that each recruiter has sufficient market to be successful, failure is not automatically built-in by chance of assignment to a given territory. Conversely, efficient allocation of recruiters is aided by reducing the market size in high propensity territories. Thus far, the indices have been used on 6 DRC RZA with very positive results and unanimous acceptance.

The potentials are markedly different for graduates (HSDG) and non-graduates (NHSDG) and for the higher mental categories (I-IIIA) vs. the lower (IIIB or IV). The next three charts show the different patterns for each category, the first two by cluster group, then as defined for the top and bottom 5 DRC. Clearly the penetration of HSDG recruits has been concentrated in the poorest cluster groups-urban(U3) and rural(R2). However the higher mental categories came from the middle scale groups. The most affluent groups show underpentration for both categories.

% PENETRATION OF RECRUITS INTO MALES, 17-21 YEARS

1. ACTUAL 17-21 MALE CONTRACTS, TOT HSDG - BARS
2. ACTUAL 17-21 MALE CONTRACTS, TOT MC-HI - RODS



NHSDG/IIIB-IV		ALL HSDG		ALL I-IIIA		HSDG/I-IIIA	
CLUSTER GROUP	PROP. INDEX	CLUSTER GROUP	PROP. INDEX	CLUSTER GROUP	PROP. INDEX	CLUSTER GROUP	PROP. INDEX
U3	217	U3	182	R1	128	R1	130
R2	134	R2	155	S3	115	S3	113
T2	130	T2	131	T2	110	T2	109
U2	107	R1	99	T1	106	T1	106
R1	99	U2	90	R2	104	R2	103
S3	90	S3	82	U3	99	U2	91
U1	74	U1	72	U2	93	U3	91
T1	70	T1	72	S1	80	S1	86
S1	38	S1	56	U1	63	U1	65
S2	26	S2	38	S2	50	S2	56

	HIGH SCHOOL GRAD MALES		MENTAL CATEGROY I-IIIA MALES	
	DRC	INDEX	DRC	INDEX
TOP	HONOLULU	212	HONOLULU	142
	MONTGOMERY	166	COLUMBUS	138
	JACKSONVILLE	157	BALTIMORE/WASH	133
	JACKSON	157	PHOENIX	126
	MIAMI	151	CONCORD	124
BOTTOM	DES MOINES	71	LITTLE ROCK	71
	SALT LAKE	70	CHICAGO	70
	CLEVELAND	66	RALEIGH	69
	SEATTLE	66	LONG ISLAND	63
	DENVER	65	NEW ORLEANS	62

$\bar{x} = 100$

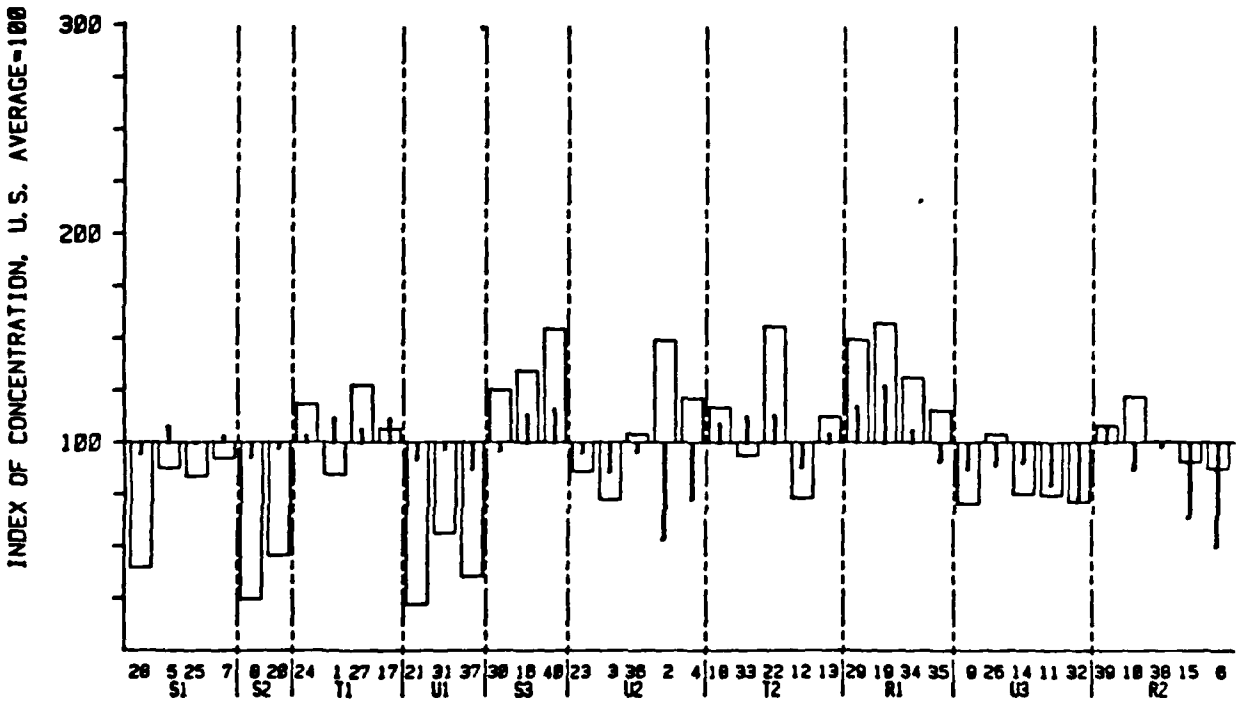
The degree of variance shown in these data shows that the options for differential action created by this information are highly meaningful.

NATIONAL ADVERTISING

The forte of Claritas is market targeting and its application to national advertising. A subsidiary service offered by Claritas is PRIZM (Potential Rating Index by ZIP Markets) formed in 1978 by linking the Cluster System with the Simmons Market Research Bureau annual survey of print media readership and product usage. This survey interviews 15,000 respondents yearly. By using PRIZM to identify the readership profiles, a match can be made of the accession profile and print media profile to discover the geographic areas where coverage is either lacking or oversaturated. The comparative profile of the three year magazine coverage for those publications purchased and in the Simmons data base compared to HSDG, I-IIIA, accessions is shown below where the 40 Claritas Clusters are indicated in descending quality on the abscissa and per capita penetration (concentration) on the vertical:

P·R·I·Z·M

1. Recruits: Penetration of HSDG, I-IIIA into Males, 17-21- Bars.
2. 3 Year Army Magazine Schedule, SMRB Readers in Adult Population, 18+ Years Old. -Rods



SOURCE: 1. PRIZM (U.S. CENSUS DEMOGRAPHY). 2. Simmons 1976-79 Survey

Wherever a difference exists between the bar and spike a mismatch of readership to market occurred. The use of this information can be in either of two forms; a reinforcement of success or as a means of changing the accession pattern. The PRIZM profiles are particularly important in the analysis of specific publications or broadcast programs. Below are two charts, one showing the profile correlation of individual magazines to the HSDG, I-IIIA accessions; the other, of a specific MOS (Military Police) to TV shows in the 1976-79 data base:

PRISM

SPEARMAN CORRELATION

TOP 20 POS./NEG. SUMMARY
FOR 88202. ARMY CON: HSDG/MC-HI/17-21 YR OLD MALES

CORR. COEFF.	TITLE
	TOP 20 POSITIVE CORRELATIONS
0.785	FIELD & STREAM: AVG ISSUE AUD(MALE)
0.725	FIELD & STREAM: AVG ISSUE AUD(ADULT)
0.695	SPORTS AFIELD: AVG ISSUE AUD(ADULT)
0.687	OUTDOOR LIFE: AVG ISSUE AUD(ADULT)
0.685	OUTDOOR LIFE: AVG ISSUE AUD(MALE)
0.685	SPORTS AFIELD: AVG ISSUE AUD(MALE)
0.638	MECHANIX ILLUSTRATED: AVG ISSUE AUD(ADULTS)
0.635	MECHANIX ILLUSTRATED: AVG ISSUE AUD(MALE)
0.623	WOMAN'S DAY: AVG ISSUE AUD(FEMALE)
0.611	POPULAR MECHANICS: AVG ISSUE AUD(MALE)
0.574	POPULAR MECHANICS: AVG ISSUE AUD(ADULT)
0.574	FIELD & STREAM: AVG ISSUE AUD(FEMALE)
0.563	FAMILY CIRCLE: AVG ISSUE AUD(FEMALE)
0.560	WOMAN'S DAY: AVG ISSUE AUD(ADULT)
0.550	SPORT: AVG ISSUE AUD(FEMALE)
0.549	OUTDOOR LIFE: AVG ISSUE AUD(FEMALE)
0.542	REDBOOK: AVG ISSUE AUD(ADULT)
0.530	FAMILY CIRCLE: AVG ISSUE AUD(ADULT)
0.529	REDBOOK: AVG ISSUE AUD(MALE)
0.520	GOOD HOUSEKEEPING: AVG ISSUE AUD(FEMALE)
	TOP 20 NEGATIVE CORRELATIONS
-0.532	PEOPLE: AVG ISSUE AUD(ADULT)
-0.549	PEOPLE: AVG ISSUE AUD(MALE)
-0.574	ESQUIRE: AVG ISSUE AUD(ADULT)
-0.580	THE NEW YORKER: AVG ISSUE AUD (FEMALE)
-0.595	ESQUIRE: AVG ISSUE AUD(MALE)
-0.605	THE NEW YORKER: AVG ISSUE AUD(ADULT)
-0.610	NEW YORKER: AVG ISSUE AUD(MALE)
-0.641	MS: AVG ISSUE AUD(ADULT)
-0.644	MS: AVG ISSUE AUD(FEMALE)
-0.646	NEW YORK MAGAZINE: AVG ISSUE AUD(MALE)
-0.651	NEW YORK TIMES DAILY: AVG ISSUE AUD(FEMALE)
-0.652	NEW YORK TIMES MAGAZINE: AVG ISSUE AUD(FEMALE)
-0.653	VOGUE: AVG ISSUE AUD(FEMALE)
-0.680	VOGUE: AVG ISSUE AUD(ADULT)
-0.685	NEW YORK TIMES MAGAZINE: AVG ISSUE AUD(ADULT)
-0.687	NEW YORK MAGAZINE: AVG ISSUE AUD(FEMALE)
-0.710	NEW YORK TIMES MAGAZINE: AVG ISSUE AUD(MALE)
-0.714	NEW YORK TIMES DAILY: AVG ISSUE AUD(ADULT)
-0.714	NEW YORK MAGAZINE: AVG ISSUE AUD(ADULT)
-0.717	NEW YORK TIMES DAILY: AVG ISSUE AUD(MALE)

PRISM

SPEARMAN CORRELATION

TOP 20 POS./NEG. SUMMARY
FOR SP155. TOTAL MOS 958, MILITARY POLICE

CORR. COEFF.	TITLE
	TOP 20 POSITIVE CORRELATIONS
0.637	WONDERFUL WORLD OF DISNEY: AVG 1/2 HR AUDIENCE
0.523	CHARLIE'S ANGELS: AVG 1/2 HR AUDIENCE
0.504	STARSKY & HUTCH (PRIME TIME): AVG 1/2 HR AUDIENCE
0.494	THREE'S COMPANY: AVG 1/2 HR AUDIENCE
0.449	BARETTA (PRIME TIME): AVG 1/2 HR AUDIENCE
0.438	GENERAL HOSPITAL: AVG 1/2 HR AUDIENCE
0.403	DAYS OF OUR LIVES: AVG 1/2 HR AUDIENCE
0.393	LITTLE HOUSE ON THE PRAIRIE: AVG 1/2 HR AUDIENCE
0.362	ALICE: AVG 1/2 HOUR AUDIENCE
0.359	NBC SATURDAY NIGHT MOVIES: AVG 1/2 HR AUDIENCE
0.358	BIONIC WOMAN: AVG 1/2 HR AUDIENCE
0.356	NBC NIGHTLY NEWS - SATURDAY: AVG 1/2 HR AUDIENCE
0.354	HAPPY DAYS: AVG 1/2 HR AUDIENCE
0.354	LOVE BOAT: AVG 1/2 HR AUDIENCE
0.348	ONE LIFE TO LIVE: AVG 1/2 HR AUDIENCE
0.345	LAVERNE AND SHIRLEY: AVG 1/2 HR AUDIENCE
0.331	ALL IN THE FAMILY: AVG 1/2 HR AUDIENCE
0.328	FISH: AVG 1/2 HR AUDIENCE
0.311	FAMILY FEUD: AVG 1/2 HR AUDIENCE
0.290	THE YOUNG AND THE RESTLESS: AVG 1/2 HR AUDIENCE
	TOP 20 NEGATIVE CORRELATIONS
-0.009	M*A*S*H: AVG 1/2 HR AUDIENCE
-0.015	ANOTHER WORLD: AVG 1/2 HR AUDIENCE
-0.025	ABC WEEKEND NEWS - SUNDAY: AVG 1/2 HR AUDIENCE
-0.039	CBS SATURDAY NEWS W/SCHIEFFER: AVG 1/2 HR AUDIENCE
-0.052	CBS WEDNESDAY NIGHT MOVIE: AVG 1/2 HR AUDIENCE
-0.093	60 MINUTES: AVG 1/2 HR AUDIENCE
-0.125	NBC TODAY SHOW: AVG 1/2 HR AUDIENCE
-0.208	CBS EVENING NEWS W/CRONKITE: AVG 1/2 HR AUDIENCE
-0.369	SATURDAY NIGHT LIVE: AVG 1/2 HR AUDIENCE

It is even possible to correlate specific demographic factors and HSDG, I-IIIA accessions as shown in the following chart:

SPEARMAN CORRELATION

TOP 20 POS./NEG. SUMMARY
FOR BN202. ARMY CON: HSDG/MC-HI/17-21 YR OLD MALES

CORR. COEFF.	TITLE	CORR. COEFF.	
	TOP 20 POSITIVE CORRELATIONS		TOP 20 NEGATIVE CORRELATIONS
0.800	% CRAFTSMEN & FOREMEN	-0.534	% HH'S W/PUBLIC SEWER
0.750	% HH'S W/$14-20K INCOMES	-0.552	% PROFESSIONAL & TECHNICAL
0.673	% RES. 5 YEARS AGO SAME HOUSE	-0.566	% POP. 25+ W/4+ YRS COLLEGE
0.613	% MOVED IN 11-20 YEARS AGO	-0.567	% RES. 5 YRS. AGO DIFF. STATE
0.607	% HOUSING IN MOBILE UNITS	-0.577	% POP. RUSSIAN FOREIGN STOCK
0.597	% MANUFACTURING, DURABLE GOODS	-0.582	% MOVED IN PAST 2 YEARS
0.594	BLUE/WHITE COLLAR RATIO	-0.589	% 1-PERSON HOUSEHOLDS
0.568	% HOUSING IN SINGLE UNITS	-0.594	WHITE/BLUE COLLAR RATIO
0.564	% POP. 25+ W/4 YRS. HIGH SCHOOL	-0.597	% EDUCATIONAL SERVICES
0.519	% 4-5 PERSON HOUSEHOLDS	-0.604	% POP. CUBAN FOREIGN STOCK
0.514	% HH'S W/FOOD FREEZER	-0.624	% POP. AGED 18-24 YEARS
0.506	% POP. AGED 6-13 YEARS	-0.632	% PRIMARY SINGLES
0.494	% OPERATIVES	-0.662	% UNITS RENTER OCCUPIED
0.489	% 3-PERSON HOUSEHOLDS	-0.696	% PUBLIC ADMINISTRATION
0.489	% POP. AGED 0-5 YEARS	-0.696	% POPULATION IN GROUP QUARTERS
0.481	% POP. AGED 14-17 YEARS	-0.701	% POP. YIDDISH MOTHER TONGUE
0.475	% 6+ PERSON HOUSEHOLDS	-0.706	% HOUSING IN MULTI-UNITS
0.472	% HH'S W/ONE CAR	-0.720	% FINANCE, INSUR. & BUSINESS
0.458	% NON-METRO RESIDENTS	-0.732	% POPULATION ENROLLED IN COLLEGE
0.452	% CONSTRUCTION	-0.789	% PROFESS'L & RELATED SERVICES

By overlaying both print and broadcast profiles a total media package can be analyzed and tailored to the recruiting market, by adding and subtracting various magazines or programs.

The Cluster System and profiles are directly applicable to direct mail analysis. Each year over two million seniors receive at least five direct mail pieces from the Army and Army Reserve. The universe of names mailed as well as the responses to these offers, can be summarized to the ZIP level and tabulated by Cluster. Responses divided by promotions mailed at the Cluster level provide a measure of mail success, the percent response. Differences by Cluster in percent response can be statistically evaluated as predictors of response in subsequent campaigns. Unproductive ZIP's can be eliminated from future mailings, thereby raising the rate of return on the marketing investment. Different offers, premiums, and tests of copy can also be evaluated by Cluster and selectively used for more efficient promotion.

Currently on-going is an analysis of a mail-back campaign offering a pair of tube socks for responding. Ultimately, it is anticipated that actual end results, i.e., contracts, can be tracked back to inquiries from a specific mail promotion. In this manner, the bottom line effectiveness of the mail can be further tightened. In previously analyzing millions of direct mail promotions, the Cluster characteristics of persons who accept a premium but don't act on the offer are very different from the serious buyers.

RECRUITER ASSIGNMENT

USAREC assigns or reassigns over 3000 recruiters each year. Although some personnel express specific desires on location of assignment, most are strictly chance selections. Even if the recruiter specifies a request for a specific geographic area, the demographics of the population of two adjacent stations can be quite different. Since it is an accepted hypothesis that one is more comfortable, and has a greater probability of success, with populations with which one can relate, the Claritas Clustering system can be applied to recruiter assignment.

Assignments to recruiting command are generally known 90 days in advance, and often 180 days. Each projected gain has a unique set of demographic characteristics, most of which are predictable by simply identifying his/her place of birth (POB) and home of record (HOR). The ZIP Codes of the POB and HOR, and the associated Claritas Clusters can be used to generally describe the demographic heritage of the recruiter. As an example, the demographics of a recruiter raised in ZIP Code 60085 can be generalized a follows:

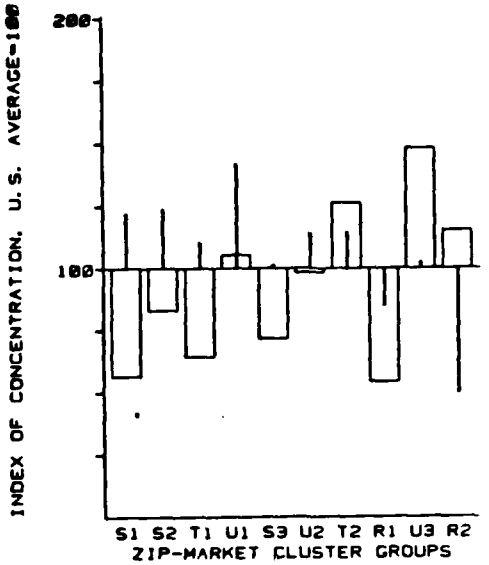
> These transitional neighborhoods are dense, urban, middle-class, mainly composed of duplex rows and 3-4 unit "railroad" flats built in the 1940's and pre-WWII period, many in the fringes of major industrial cities coast to coast and corner to corner. The populace has a high concentration of foreign stock (European), once heavily blue collar union people, but now more white collar. Although the population is aging and declining, the young adults are generally well-educated and in technical, sales and junior management positions. From a recruiting standpoint, the population is generally pro-military with active American Legion and VFW posts and national holiday parades.

Since vacancies in given stations are also generally known in advance, a simple system of matching the Clusters associated with the station vacancies to the Cluster heritage of incoming recruiters accomplishes a demographic fit and hopefully greater job satisfaction and greater recruiting success.

MILITARY OCCUPATION SPECIALITY (MOS) ANALYSIS

Just as the potential by mental category and education differs demographically, so also does the propensity to enlist in a given MOS. While the basic infantry MOS (11B) shows a profile indicating a complete cross-section of population, geographically and demographically, most MOS profiles show marked differences. The military policeman (95B) is generally white and suburban, while the Hawk Missile Crewman (16D) is more urban and minority. Even within a Career Management Field (CMF) differences are vivid. The Cannon Crewman (13B) is heavily minority-oriented from Southern rural farms and Northern inner cities, while the Cannon Fire Direction Specialist (13E) is very middle America, white, rural and blue collar. This latter contrast is striking when viewed across Cluster groups.

1. MOS 13B1 CANNON CREWMAN INTO TOTAL CONT. - BARS
2. MOS 13E1 CANNONFIRE DIREC. SPEC. INTO TOTAL CONT. - RODS



The information gained from MOS analysis is readily translatable to geographic potentials, as illustrated by the station maps of the Detroit urban area on the next page. Here three MOS (13-Artillery; 19-Armor; and 95-MP) potentials are portrayed by the size of the symbol. One can note the pattern changing as one moves from the inner city and to the suburban areas.

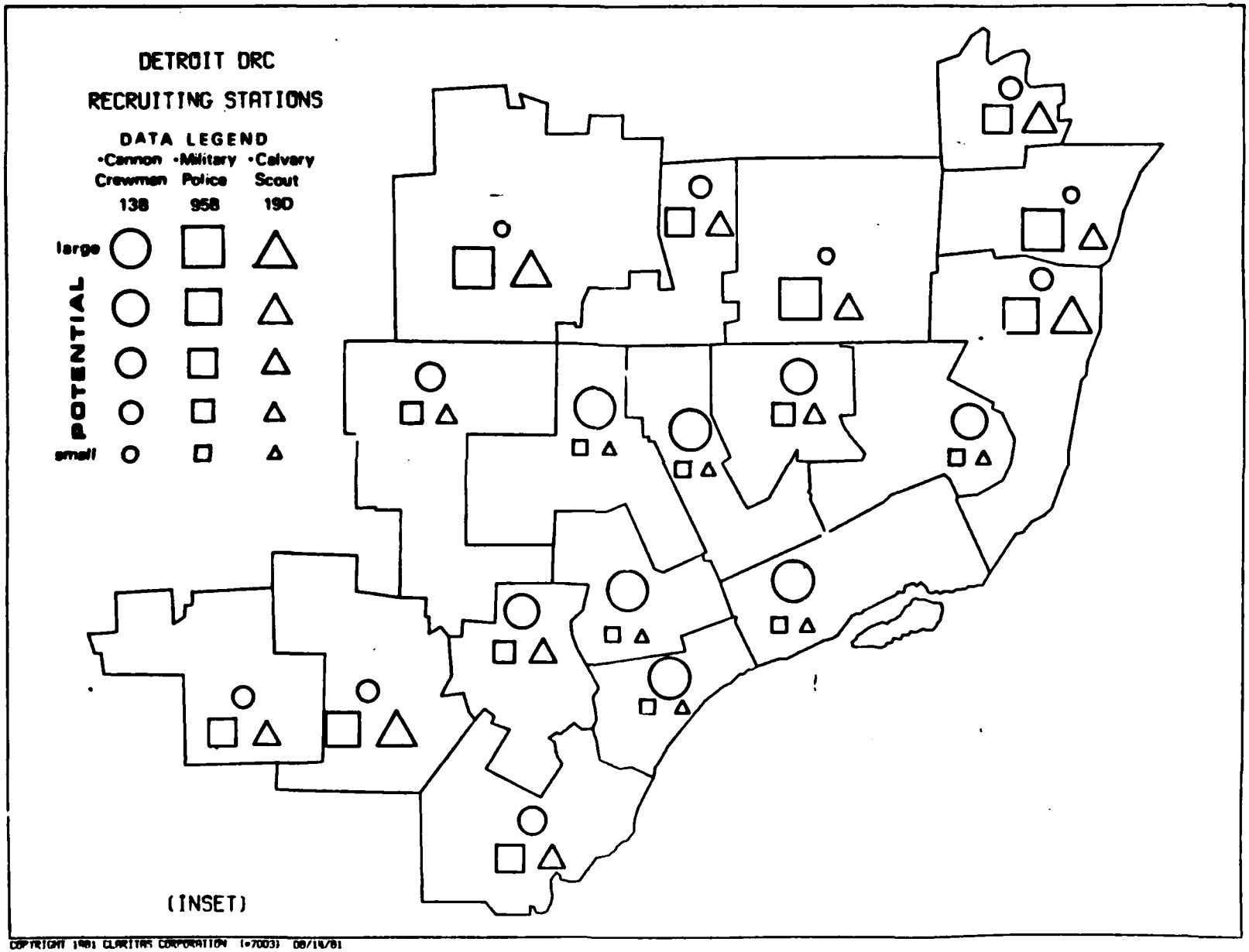
OTHER SERVICE COMPETITION TARGETING

The propensity to join one service or another is highly related to Clusters. Although past experience had indicated general geographic propensities (e.g., the Navy in the Northeast), specific ZIP Code-determined service indices were calculated from Cluster analysis. The more upscale but lower penetration Clusters tended to be stronger for the Navy and Air Force, while the Marine Corps support centered on highly urban, minority neighborhoods, especially Spanish. The Army has the greatest relative penetration in rural and small towns, also with minority emphasis. Noted for all services was the previously observed inverse relationship between propensity to join any service and affluence.

The results of this analysis have implications to recruiter allocation, mission assignment and advertising- both media selection and message content. The individual recruiter, knowing the local propensities, can tailor his sales presentation to emphasize those benefits which are the Army's competitive edge over the particular service.

LOCAL ADVERTISING

At the district and area level, the strength of the Cluster analysis is again evident. USAREC can allocate local advertising dollars in proportion to the relative levels of potential across areas. Within the local district, each commander can accurately pinpoint specific ZIP Codes for expenditure of his local funds and can tailor his media buys to the Cluster profile of the areas.



FUTURE IMPLICATIONS AND ACTIONS

USAREC is headed in the direction of a totally integrated market approach using geodemographics. Several keys and considerations are still required to fully implement the results of the present and projected analyses and actions.

The major step, which has begun, is the Cluster analysis of the FY 80 contract results, and updating penetration profiles and indices accordingly. Subsequent semi-annual updates to catch changing patterns and opportunities are envisioned.

With USAREC having the responsibility for Army Reserve recruiting, the analysis of that marketing problem is under consideration. The factors effecting the Reserve problem significantly differ from that of the Active Army, in that unit locations and vacancies are of overriding importance.

The development of an advertising media model tied into geodemographic analysis and the message content could produce a powerful triad. The specific targeting of effective media and a tailored message, all allocated based on potential return is possible. The ability to measure results and note changing patterns allows the system to rapidly react.

As a part of the current contract, Claritas is to apply the analysis at 5 DRC in a total system. It is expected that the methodology developed will be applicable to local advertising at all DRC. Since media penetrate Cluster Groups differently, the local commander will have the capability of matching market, media and message to his particular requirements. By identifying those areas where the "normal" media coverage is sparse, the commander can schedule special events designed to carry the Army's message.

USAREC has a request for proposals out to develop and field an interactive ADP system linking all levels of command, including the recruiting station. When operational, this integrated system can provide the individual recruiter with a tailored sales package geared to the demographic heritage of each prospective applicant. The recruiter's input might be no more than the home of record or current address of the applicant, along with his education level. At the USAREC computer, the Cluster associated with the applicant's ZIP Code could permit the identification of specialties and options which have a high probability of appealing to the prospect, yet tempered by the needs of the Army.

The development of recruit potential indices (RPI) by Claritas Corporation has opened new vistas in the field of market analysis for USAREC. Various alternatives strategies can be explored quantitatively. The integrated marketing approach supported by Claritas analysis will assist USAREC in facing the challenge of recruiting a larger, quality army without additional Congressionally provided resources.

BIBLIOGRAPHY

Shevky, E. and W. Bell (1955), Social Area Analysis (Stanford: Stanford University Press).

Hadden, J.K. and E.F. Borgotta (1965), American Cities: Their Social Characteristics (Chicago: Rand McNally).

Tryon, R.C. (1955) Indentification of Social Areas By Cluster Analysis (Berkeley: University of California Press).

END

DATE
FILMED

5 -83

DTIC